BAPATLA ENGINEERING COLLEGE:: BAPATLA
(Autonomous)

OPERATIONS RESEARCH

II B.Tech.   IV Semester18MA005 (CSE)

Lectures	:	4 Periods/Week Credits - 3	Continuous Assessment	:	50
Final Exam	:	3 hours	Final Exam Marks	:	50

Pre-Requisite: None

Course Objectives: Students will learn how to

➢	To derive the best and most economical solution to the given LPP within all of it's limitations in the fields of Engineering, Agricultural and manufacturing etc.
➢	To apply these techniques constructively to make effective decisions in various competitive game fields.
➢	To impart the knowledge of Operations Research in the concepts of IntegerProgramming and Dynamic Programming Problems.
➢	To understand various mathematical models of Queuing systems used in Operations Research.

Course Outcomes: After studying this course, the students will be able to

CO1	Understand the basic concepts of optimization, Linear programming and solve the LPP's using graphical method, simplex method and big-M method.
CO2	Learn how to recognize and model strategic situations for any game, to predict when and how their action will have an influence on others and exploit strategic situations for the benefit of their own.
CO3	Solve all integer programming problems by Gomory cutting plane method and able to apply dynamic programming algorithm to solve a given problem.
CO4	Evaluate the performance of a queuing system and can make performance analysis by understanding basic concepts of queuing theory.

Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes

CO's	PO's												PSO's		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	3	-	-	-	-	-	-	-	-	2	-	2	-
CO2	3	3	3	-	-	-	-	-	-	-	-	2	-	2	-
CO3	3	3	3	-	-	-	-	-	-	-	-	2	-	2	-
CO4	3	3	3	-	-	-	-	-	-	-	-	2	-	2	-

UNIT-1	(12 Hours)
LINEAR PROGRAMMING PROBLEM-GRAPHICAL METHOD: Introduction; Graphical Solution Method; Some exception cases; General Linear Programming Problem; Canonical and Standard Forms of L.P.P; **LINER PROGRAMMING-SIMPLEX METHOD:** Introduction, Fundamental Properties of Solutions (without proofs);the Computations Procedure, Use of Artificial Variables (Big-M method), Degeneracy in Linear Programming. [Sections:3.1; 3.2; 3.3; 3.4; 3.5; 4.1; 4.2; 4.3; 4.4; 4;5]	

UNIT-2	
	(12 Hours)
GAMES AND STRATEGIES: Introduction; Two-person Zero –Sum Games; Some Basic terms; The Maximin-Minimax Principle; Games Without Saddle Points-Mixed Strategies; Graphic Solution of 2xn and mx2 games; Dominance Property. [Sections:17.1; 17.2; 17.3; 17.4; 17.4; 17.6; 17.7]	

UNIT-3	(12 Hours)
INTEGER PROGRMMING PROBBLEM: Introduction; Pure and Mixed Integer Programming Problem; Gomory's All-Integer Programming Problem Method; Construction of Gomory's Constraints; Fractional Cut Method-All integer LPP; Branch and Bound Method. **DYNAMIC PROGRAMMING**: Introduction; the Recursive Equation Approach; Characteristics of Dynamic Programming; Dynamic Programming Algorithm. [Sections:7.1; 7.2; 7.3; 7.4; 7.5; 7.7; 13.1; 13.2; 13.3; 13.4]	

UNIT-4	(12 Hours)
QUEUING THEORY: Introduction; Queuing System; Elements of a Queuing System; Operating Characteristic of a Queuing System; Deterministic Queuing System; Probability Distributions in Queuing System; Classifications of Queuing Models; Definition of Transient and Steady States; Poisson Queuing Systems: Model-I(M/M/I): (∞/FIFO),Model-II(M/M/I):(∞/SIRO),Model-III(M/M/I):(N/FIFO),Model-IV(Generalized Model: Birth-Death Process). [Sections: 21.1; 21.2; 21.3; 21.4; 21.5; 21.6; 21.7; 21.8; 21.9]	

Text Books :	KanthiSwarup, P.K Gupta & Man Mohan, 'Operations Research' Sultan Chand & Sons, New Delhi,13th Edition,2007.
References :	[1] SD.Sharma, "Operations Research", Kedarnath, Ramnath& Co., Meerut.
	[2]HamdyA.Taha, Operations Research: An introduction, Pearson Prentice Hall, New Jersey.